of the procedure. Arterio-venous anastomosis required dissection and a master hand for the delicate suturing. The use of various types of cannulae was time-consuming, and coagulation of blood in the cannulae was troublesome. Furthermore, there were no means of direct determination of the quantity of blood given the recipient.

The citrate methods, with the use of syringes or defibrination of blood and its introduction into the vein by the gravity method, eliminated coagulation and gave us a means of measuring the quantity used; but these methods require considerable time and are cumbersome, and reaction is believed to follow the citrate method more frequently. The statement is made that some reaction occurs after 10 per cent of all transfusions and that the percentage is unaffected whether whole or citrated blood is used. Lewisohn investigated the effects in a long series of parallel cases in which different methods were employed, and concluded that the results following the use of citrated blood were as good as any other method. In my experience, reaction has followed the use of the citrate method only. More important, however, than the question of possible reactions following transfusion is the rapidity and ease with which it can be performed. The ease and rapidity with which Brooks performs transfusion with his new technique in the patient's room, with the assistance of one nurse, suggested to me that this was by far the simplest technique that I had ever seen. When I attempted to do the same thing, I concluded that it would be very simple if it were not so difficult to insert the large cannula into the vein. This, however, is a matter of a little practice.

As suggested by Doctor Eloesser, I have found that nicking the skin before trying to insert the cannula is helpful, and it is important to have the end of the cannula sharp. I noticed that Brooks has a sterile hone in his armamentarium for this purpose. Having seen Dr. Brooks perform transfusion, and having used it in several cases myself, I am convinced that his method is practicable. His results certainly confirm his claims.

DOCTOR BROOKS (closing)—The most important single factor is the insertion of the needle into the vein in a clean-cut manner. One cannot escape the fact that practice helps in this connection.

Doctors Eloesser and Cowan have both spoken of nicking the skin with a cataract knife and inserting the needle through this point. This is, I believe, a very good suggestion, especially if the needles on the market are used as they are offered. I have not found this necessary, however, because I have my needles sharpened so that the point and the edges of the bevel present a very sharp cutting edge. This makes the insertion of the needle through the skin very easy and practically painless. One should not attempt to enter the vein until after the skin has first been definitely punctured. This is made easier by retracting the skin over the vein slightly to one side to make the puncture.

Since this paper was sent to the editor, I have had thirty-eight additional transfusions, without a single reaction. I am frequently asked as to where the tubes and needles may be had. They are handled by Travers Surgical Company in San Francisco.

To have had an operation of some kind is an asset to the modest entertainer, to have had an operation requiring the patient to be two hours under the anesthetic is a superior asset and entitles the sufferer, or beneficiary, as the case may be, to a certain amount of recognition; but to have been miraculously healed of some real and indescribable, or imaginary ailment is the superlative asset and assures the favored one of the envy of all her friends.—Editorial, Journal Kansas Medical Society.

In its proper sense, reading is a process involving the exercise of the intellect. It is not a passive method of infiltration; it is an active mental function, during which the mind constantly reacts to impulses gathered from the page, bringing into play the qualities of judgment, analysis, a score of others.—O. J. Lewis (Saturday Review).

You know who the critics are? The men who have failed.—Disraeli.

THE TREATMENT OF HERPES ZOSTER

By HARRY P. JACOBSON, M. D., *Los Angeles,*
(From the Department of Dermatology, Los Angeles General Hospital)

This study is based upon a series of twelve cases of herpes zoster treated successfully by red light.

An important feature worthy of mention in connection with this treatment is the absolute arrest of the disease process and its extension when treatment is begun early.

The employment of red light in the treatment of zoster lesions seems to prevent suppuration in early cases, hastens crusting and resolution in suppurative cases and prevents deep scarring in all patients, no matter how severe the eruption.

Exposure of the segment of the spine corresponding to the region of the affected posterior root ganglia to the red light seems to alleviate the associated neuralgic pain, which is such an annoying symptom in herpes zoster.

DISCUSSED *by E. K. Stratton, M. D., San Francisco; F. C. Nichols, M.D., Los Angeles; W. J. Stone, M.D., Pasadena; H. E. Alderson, M.D., San Francisco.*

THE purpose of this communication is to register some observations on the efficacy of red light in the treatment of herpes zoster. My attention was attracted to this method of treatment by H. Edward Ohlswede (Arch. of Derm. & Syph., October, 1923). That author extols the virtues of red light in the treatment of various dermatoses, and presents a number of case histories in support of his enthusiasm. Quoting Finsen and many other recognized authorities on the subject as a background, he advances the theory that, in view of the directly antagonistic positions that the red and ultra-violet rays occupy in the scheme of the spectrum, the therapeutic effects of these two agencies must necessarily also be antagonistic in character. Thus, while the ultra-violet rays, when employed for therapeutic purposes, provoke hyperemia and inflammation, the red rays when employed similarly should allay inflammation—one type of ray counteracting the effects of the other.

With the above plausible considerations as an incentive before me, I decided to give this method a trial and chose herpes zoster for the purpose.

Herpes zoster is distinctly an acute inflammatory disease and, in accordance with the above theoretical reflections, should react favorably to the application of the red rays; and while in the absence of complications this disease process is self-limited, frequently, and especially in the aged and the infirm, traumatism or secondary infection are superimposed, and then the condition assumes a more serious aspect, taxing our therapeutic resources to the limit, in a vain effort at alleviating the suffering of the patient. As an illustration of what the red light will accomplish in these complicated cases, the following case histories will serve as examples:

CASE No. 1—Male, American 60 years old, hotel clerk, sustained an injury to his back through a fall September 26, 1923. Two days following that accident he developed severe neuralgic pain on the right side of the body in the dorsolumbar region anteriorly and posteriorly. About twenty-four hours after the onset of pain a vesiculo-papular eruption made its appearance in that region. Gradually, in spite of intelligent and diligent treatment at the hands of the family physician, the condition grew progressively worse. The herpetic lesions became secondarily infected and caused the patient a good deal of discomfort and pain.

On October 27, I saw this patient with Dr. Stoner.

There was an area of infiltration on the right side of the patient's body corresponding to the region supplied by the sixth to the tenth dorsal nerves. This infiltrated area was studded with numerous sluggish ulcers arranged in groups which were fairly deep in extent and contained a sero-purulent exudate. In spite of the condition having endured more than four weeks, there was no evidence of healing.

The treatment instituted consisted of exposure of the lesions to the red light daily for a period of twenty minutes at a distance of 24 inches from the focus of the ray. After five such exposures, the patient was discharged as completely cured.

CASE NO. 2—Male, 69 years of age. Referred to me by the out-patient department of the Los Angeles County Hospital August 12, 1924, and discharged as cured August 16, 1924.

His present illness commenced with a stinging and burning sensation on the right side of the body about sixteen days prior to his first visit to the office. Two days following the onset of pain a papulo-vesicular eruption appeared in the back and front in the region of the liver. Since that time various remedies had been tried, and in spite of all efforts the condition had grown progressively worse. He complained of having lost 19 pounds in weight since the onset of the trouble, due to sleepless nights, and voluntereed the information that unless relief was afforded him soon by medical means he would do something desperate.

Examination showed involvement similar to that of the first patient. There was an infiltrated area in the same region and approximately of the same extent as in the first patient, except that the ulcerations seemed to have been more numerous. As in the first case, the lesions were exposed to the red light daily for twenty minutes and on the fifth visit the patient was discharged as clinically cured.

Here we have an example of herpes zoster complicated by secondary infections in patients of fairly advanced age and below par physically. When presenting themselves for treatment the condition in one patient had endured four weeks, and in the other patient sixteen days. There was no evidence of improvement subjectively or objectively in either case, in spite of intelligent and diligent medical care. Five exposures to the red light on five successive days for twenty-minute periods accomplished a clinical cure in both cases, except that one of these patients complained of some post-herpetic pain at the time of discharge.

In addition to the cases cited, ten others were treated successfully by the same method. In this group there were seven males and three female patients, in ages ranging from 9 to 70 years. The duration of the disease at the time the red light treatment was begun averaged five days. The eruption was situated on the trunk in five patients, involving the region supplied by the sixth to the tenth dorsal nerves in four, and in the fifth the pectoral region alone was implicated. One patient had an involvement of the gluteal region and the lower abdominal quadrant on the right side. In one there was an extensive involvement of the neck, chest, shoulder and arm, and in another the neck only was involved. There was one case of supra-orbital zoster, and another patient presented lesions on both lips and right cheek. The number of treatments required for a clinical cure in these patients varied from two to six.

ANALYSIS

This study is based upon a series of twelve cases of herpes zoster treated successfully by red light. The most striking feature noted in the treatment was the rapid involution of the lesions, usually beginning after the first exposure to the light. As already indicated above, the process of complete involution is accomplished in a period of two to six days, depending upon the severity and extent of the involvement, and consists of a desiccation of the contents of the vesicles with a conversion of the inflammatory products into thin, loosely adherent crusts which separate and fall off easily.

An important feature worthy of mention in connection with this treatment is the absolute arrest of the disease process and its extension when treatment is begun early. This fact was demonstrated, to my satisfaction, by two patients in this series—one who presented herself with an early zoster with only two groups of lesions on the neck, with evidence of more lesions in the process of evolution, and the other with a pectoral involvement—also an early case. Institution of early treatment in both of these patients apparently prevented an extension of the disease process, and reduced the required number of treatments to two in accomplishing a clinical cure.

One more point which should be emphasized in recommending this method in the treatment of herpes zoster is the absence of deep scarring and pigmentation, so common following the treatment of severe cases by other methods, and so uniformly absent in even the most extensive cases treated by the red light. This feature becomes of especial importance when the patient happens to be a female with involvement of some exposed part of the body. There was one such case in this series—the wife of a physician, very prominent socially, who had a severe and extensive involvement of the neck and upper part of the chest, shoulder and arm, and who presented herself for treatment about six days after the lesions were fully developed. Fortunately, the skin lesions involuted completely in five days, though the patient continued to suffer from post-herpetic pain for some time after their disappearance.

TECHNIQUE

The technique of the treatment is very simple. The patient undresses, and the affected part is exposed to the red light for a period of twenty minutes at a distance of twenty-four inches from the focus. The source of light consists of a thousand-watt red globe, so adjusted that its rays will strike the lesions in a perpendicular direction. These exposures are repeated daily until the lesions are completely involuted. It is also advisable to expose the spinal column in the region of the seat of the trouble to the rays of light for the immediate sedative effect which this treatment exercises.

OTHER METHODS OF TREATMENT

That the more usual methods of treatment of herpes zoster are not entirely satisfactory, may be judged from the variety of remedial agents ordinarily employed. These include internal as well as external remedies, and comprise ointments, lotions, pastes, cuppings, plasters, ethyl chloride sprays, opiates, and other narcotics and various electric currents, such as the galvanic faradic, high frequency, and the roentgen ray.

One recent therapeutic suggestion employed with

success by its author is offered by Howard Fox. It consists of an occlusion paraffine dressing applied by means of an atomizer. Fox has reported a series of seventeen patients treated by this method with uniform success. It is quite obvious, however, that even this method, though satisfactory as far as ultimate results are concerned, is not as attractive in its application as might be desired. It entails the use of oil, cotton, bandages, thus adding discomfort to the already existing misery of the patient. The objectionable features are entirely obviated by the use of the red light.

But it may be asked whether our judgment may not be biased in favor of red light, since it is natural to become enthusiastic about anything in which one is especially interested. To meet any criticism of the sort, I shall cite a few historical facts dealing with the subject and, if possible, indicate the wide favor that this remedy has enjoyed at the hands of prominent physicians, even centuries ago.

HISTORICAL

As early as the fourteenth century the application of the principle of photo-therapy was practiced on the son of King Edward I, who was suffering from smallpox. He was treated by being placed in bed, covered with scarlet blankets, and with scarlet hangings covering the walls of the room; gargling his throat with mulberry wine, and sucking the juice of red pomegranates. He recovered completely from the attack, without any trace of the disease remaining in evidence.

Also in the time of Queen Elizabeth the value of red curtains, red coverlets, and red glass about the bed of smallpox patients was loudly proclaimed by certain physicians.

In more recent times many instances of the empirical but successful employment of red light in the treatment of the exanthemata and in other dermatoses are recorded in the literature. In 1893 there was an epidemic of smallpox in Norway, and Lindholm used the red light to good advantage. In describing the results obtained by the use of red light in smallpox, his assistant, Svendsen, says: "The period of suppuration, the most dangerous and most painful stage of smallpox, did not appear; there was no elevation of temperature and no edema. The patients entered the stage of convalescence immediately after the stage of vesiculation. The hideous scars were avoided. In the same year George H. Fox, in this country, made a study of the effects of red light on smallpox. The method was tried on a few cases only in the Riverside Hospital, New York, under the direction of Cyrus Edson. The results were entirely negative.

In 1895 Finsen collected reports from a number of physicians in different European countries who have treated smallpox by means of red light. The total number of cases so treated were seventy, with complete success in sixty-nine. Based upon these results and a series of original experiments, Finsen attempted to give the practice of photo-therapy a scientific explanation, and formulated a set of guiding rules for the treatment of smallpox by this method. In 1897 Montague L. B. Rood, surgeon in the British Royal Navy, used the red light in the treatment of smallpox, with results surpassing his highest expectations. In 1903 Jay F. Schamberg tried the red light method on two cases of smallpox with completely negative results. In publishing these negative results the author utilizes the occasion for a criticism of Finsen's explanation of the action of the red light in smallpox.

In the same year (ten years since Finsen's first advocacy of red light as a therapeutic agent in smallpox) Finsen published the results of a large series of cases of smallpox treated by red light by twenty physicians in different European countries, with uniform success in all of them.

There are, in addition, many other reports on record of the value of red light in smallpox. While some of these reports minimize the value of this method, the consensus of opinion is, that the employment of this agency in the treatment of this disease results in the total or partial suppression of suppuration and its concomitant fever and the absence of scarring.

Assuming that the reported observations are reliable, it appears that, in view of the similarity of the pathological process in herpes and smallpox, there should be a similar reaction to a common therapeutic agent in both conditions.

From the meager experience afforded by the twelve cases of zoster in this series, I am prepared to corroborate the observations recorded in the literature by the above-mentioned workers. The employment of red light in the treatment of zoster lesions seems to prevent suppuration in early cases, hastens crusting and resolution in suppurative cases and prevents deep scarring in all patients, no matter how severe the eruption. In addition, the exposure of the segment of the spine, corresponding to the region of the affected posterior root ganglia to the red light, seems to alleviate the associated neuralgic pain, which is such an annoying symptom in herpes zoster. These salutary effects are apparently produced by a direct action of the red frequency upon the seat of the disease process. This ray, whose wave length is the longest of any in the visible spectrum, penetrates deeply to the inflammatory process, re-establishing there the circulatory equilibrium, stimulates the cellular elements concerned in the disposal of the inflammatory and hemorrhagic products, and hastens resolution.

SUMMARY AND CONCLUSION

1. A series of twelve cases of herpes zoster treated successfully by the red light is reported.

2. The advantages of the treatment consist of the simplicity of the method, the rapid involution of the lesions, the prevention of secondary infection, and elimination of post-herpetic scarring and pigmentation.

3. While in most cases the employment of this remedy stops the pain permanently, in two cases of this series the patients complained of pain after disappearance of the lesions. Intravenous administration of sodium iodide in small doses to one patient soon stopped this annoying symptom permanently.

4. A partial review of the literature on the subject is submitted, containing evidence of the successful application of the principle of red light in the

treatment of smallpox as far back as the fourteenth century.

5. A possible explanation of the modus operandi of the action of this ray is offered, and is based upon the belief that this frequency of the spectrum penetrates to the seat of the pathology in these cases, where it acts as a cellular stimulant and nutrient and equalizes the circulatory imbalance.

6. It is admitted that the number of cases here recorded is entirely inadequate from which to draw absolute deductions. However, we feel that the evidence so far adduced is sufficient to justify its further employment, not only in herpes zoster, but in other allied pathological skin processes, with prospects of success.

I desire to express my gratitude to Doctor A. Davidson, consulting dermatologist, Los Angeles General Hospital, for his help and suggestions in the preparation of this paper. Also to Emil E. Bogen of the out-patient department for his valuable aid and selection of the cases of herpes zoster, and for many other kindnesses in connection with this publication.

1016 South Alvarado Street.

DISCUSSION

ERNEST K. STRATTON, M. D. (350 Post Street, San Francisco)—Until the actual cause of herpes zoster is known, the treatment must necessarily be symptomatic and palliative. I believe that the local treatment should be as simple as possible, opening the larger vesicles and applying an aseptic powder in order to favor desiccation. Wet dressings and ointments should be avoided, as they only serve to favor infection, which leads to ulceration and scar formation. Jacobson's experience with the red light therapy is very interesting and, in view of his brilliant results, we should bear in mind this means of therapy in handling any stubborn or complicated case of herpes zoster. Butler found that the quantity of energy which could be absorbed by the skin was much greater with the visible red ray, which has a wave length of 7000 Angstrom units, than with the invisible, explaining the difference in absorptions to the special faculty which the coloring matter of the blood possesses for absorbing luminous radiations; consequently the heat reaching the deeper structures by conduction is much more intense in the case of luminous irradiations.

FRED C. NICHOLS, M. D. (1136 West Sixth Street, Los Angeles)—It is interesting to note the good response that the doctor has experienced in the use of the red ray. Herpes zoster is generally conceded to be an infectious process, more or less self-limited in its course, and anything that can be done to relieve the patient should be welcomed with both arms. The simple cases where there is no secondary infection we have found to respond very kindly to paraffin dressings, as suggested by Howard Fox. The pain is almost instantly relieved and envolution takes place in a very few days. The cases which carry a secondary infection to any great extent do not respond so kindly to the paraffin applications. The galvanic current, applied two or three times daily along with soothing protective dressings, usually affords great relief. In the severe type of cases, as cited by Jacobson, the therapy has been especially unsatisfactory, and his suggestions as to the use of the red light should be given the highest consideration.

WILLARD J. STONE, M. D. (Security Building, Pasadena)—I have always regarded herpes zoster as a cutaneous trophic manifestation of a neuritis involving the larger or smaller nerves supplying the area involved. The lesions commonly become inflammatory because of the lowered tissue resistance and the presence always in the hair follicles and sweat ducts of the staphylococcus albus. The surmise that the red rays of the spectrum are desiccating and soothing in character, as opposed to the hyperemic and stimulating effects of the ultra-violet ray, seems borne out by the results secured by Jacobson. The method employed by him is decidedly worthy of further trial.

HARRY E. ALDERSON, M. D. (490 Post Street, San Francisco)—Jacobson has presented a subject that is becoming more important with our increasing knowledge of photo-sensitiveness of the skin. Histopathological studies now under way may produce valuable information on this subject. There is so much in the literature promoted by commercial concerns interested in the sale of various kinds of lights, that soon we may have all the colors of the rainbow represented. But the red light and the ultra-violet rays have been proven to have definite effects on the skin. So a paper of this sort is worthy of our serious consideration.

I have had no personal experience with the red light, so the report of these cases interests me very much. Records of a larger number, of course, would be most desirable. These few experiences, however, are suggestive. The light seems to have its main effect on the skin lesions in the direction of preventing or clearing up secondary infections. This same object can be accomplished by judicious applications of carbon tetrachloride C. P., followed by a protective lotion containing a powder in suspension. Oily preparations are apt to make the local condition worse. At Stanford recently we have been giving suberythema doses of the x-ray with good effect, particularly in ameliorating the pain that accompanies and follows zoster. The local application of the galvanic current in some cases will have a very good effect on the neuritis.

By our local treatment we should endeavor to dry, keep sterile, and protect the skin lesions. If the red light will do the former, which seems possible, protection may be obtained by using a lime water lotion containing 1 per cent phenol and 10 per cent zinc oxide.

DOCTOR JACOBSON (closing) — I do not know of anything that I might add to the discussion, except to express my appreciation to the discussants for the fair attitude that they have shown in commenting upon the subject matter presented. Of course, it would be unreasonable to expect earnest scientific workers to enthusiastically accept a new therapeutic agent (or shall I say an old neglected remedy) unconditionally and without reservations.

Indeed, I am fully aware that the most that could be expected, in view of the small series of cases herewith reported, would be to stimulate interest in this subject matter to a more thorough and comprehensive study on a larger scale than heretofore. If I have succeeded in accomplishing that much through this paper, I shall indeed feel amply compensated.

By diagnosis we mean a thorough knowledge of the human being that we study. Diagnosis is, therefore, an ideal which we attempt to approach, the acquisition of complete knowledge regarding any living organism being beyond our powers. More particularly, in medical diagnosis we strive to ascertain in how far a given human being is healthy or ill and the reasons therefor, by which in turn we mean in how far he is (as a whole and in each of his parts) capable or incapable of making adequate responses to the physical and psychical influences of the environment in which he lives, and why. Adequacy of responsivity indicates health, whereas inadequacy of responsivity indicates disease or anomaly. Health and disease are conditioned; it is the task of diagnosis to attempt to determine the conditioning factors in given instances.—L. F. Barker (New York Journal Medicine).

In spite of progress in certain school districts, the problem facing school administrators today is to find effective means of removing the handicap of defective vision of one-eighth of the 24,000,000 school children.

This is important, not only to *secure greater efficiency in acquiring an education, but to conserve vision for greater usefulness in adult life and in old age.*—National Committee for the Prevention of Blindness.